

### **Remarks**

Claims 1-39 are pending. Claims 12, 14, 16-18 and 20-24 are withdrawn from further consideration by the Examiner pursuant to 37 CFR 1.142(b), as being drawn to a non-elected subgroup, there being no allowable generic or linking claim. Claims 1-5, 7, 9, 11, 13, 15, 16, 19, 20, 25-27, 30, 31-32, and 34-38 have been amended by Applicant. Applicant notes the rejection of withdrawn claims 16 and 20 under 35 USC 112, second paragraph, and has amended these claims to facilitate prosecution in the event these claims are rejoined. Applicant has similarly amended withdrawn claims 31-32 and 34-38.

Claims 27 and 30 have been amended to the extent they incorporate the elected subgroup Pfu(wild type) Sso7d fusion, specifically wild type *Pyrococcus furiosus* polymerase I fused to *Sulfolobus solfataricus* SSso7d protein. Claim 40 is newly added. The claim amendments find support in the specification. No new matter has been entered.

### ***Specification***

The office action indicates that trademarks, including the VENT™ and DEEPVENT™ trademarks, disclosed in the instant application should be capitalized and accompanied by their generic terminology. Accordingly, Applicant has amended the specification so that disclosed trademarks are capitalized and accompanied by their appropriate generic terminology.

### ***Claim Objections***

Claim 3 is objected to because a period is missing at the end of the claim. Accordingly, Applicant has amended Claim 3 to include a period.

Claims 7 and 9 are objected to because these claims recite the plural "steps" when only a single active "step" of "incubating" is given. Accordingly, Applicant has amended Claims 7 and 9 so that the term "steps" is replaced with "step".

### ***Claim Rejections***

112 second paragraph

Claim 27 is indefinite in the recitation of trademark/trade names VENT<sup>®</sup> and DEEPVENT<sup>®</sup> on the grounds that the claim scope is uncertain since the trademark or trade name does not identify or describe the goods associated with the trademark or trade name..

Claim 27 has been amended so that it no longer recites trademarks.

Claim 1 is rejected under 35 USC 112, second paragraph as being incomplete for omitting essential steps, such omission amounting to a gap between the steps, particularly the omitted steps are synthesizing DNA, as recited in the preamble. Applicant has amended Claim 1 has been amended so that it no longer omits an essential step.

The office action indicates that there is insufficient antecedent basis in Claim 5 for the recitation "said first DNA molecule" in line 6. Claim 6 has been amended such that it no longer contains a recitation with no antecedent basis.

Claims 1-11, 13, 15-16, 19-20, and 25-30, are rejected as being indefinite in the recitation of the term "high pH" on the grounds that the specification does not provide a standard for ascertaining the required degree. Applicant traverses the rejection on the grounds that one of skill in the art concerning polymerases would understand that a high pH is considered basic. However, for the sole purpose of advancing prosecution, Applicant has recited a range of pH values to be encompassed by the term "high pH". Applicant notes the rejection of withdrawn claims 16 and 20, and has amended these claims to facilitate prosecution in the event these claims are rejoined.

Claims 11, 13, 15, 16, 19, and 20 are rejected as being indefinite in their recitation of the term "reduced" on the grounds that the term "reduced" renders the "activity" of the claims indefinite. The office action contends that it is unclear what "reduced" is relative to, and that it is unclear if it is related to polymerase-protein fusion activity of an antecedent claim, or to the non-fused polymerase activity of an antecedent claim, or to some other activity. Claims 11, 13, 15, 16, 19, and 20 have been amended to more clearly indicate to what activity the reduced activity is in relation.

Claims 1-11, 13, 15-16, 19-20 and 25-30 are rejected under 35 USC 112, second paragraph, as being indefinite. For the recitation of the term "DNA polymerase fusion". Because the claim fails to recite what the molecule is nor does the claim define the fusion in terms of its function. Claims 1-11, 13, 15-16, 19-20 and 25-30 have been amended to more clearly describe the fusion molecule.

Claim 15 is rejected under 35 USC 112, Second paragraph, as being indefinite in its recitation of the phrase "said DNA polymerase has reduced base analog detection activity" because it is unclear whether this limitation is a further limitation to its parent claim which recited that the DNA polymerase has a reduced polymerization activity.

Applicant traverses the rejection on the grounds that the addition of a further limitation of "reduced base analog detection activity" clearly and distinctly characterizes the claimed subject matter. One of skill readily realizes there are a multitude of factors which contribute to reduced polymerization activity of a polymerase. However, claim 15 has been amended to more clearly indicate to what the reduced activity is in relation.

Claim 7 is indefinite in the recitation of the phrase "under proper conditions" on the grounds that it is unclear whether these conditions refer to a fusion of a mutated polymerase or other mutated protein, or whether the conditions refer to amplification parameters such as time or temperature, or to something else..

Applicant respectfully traverses the rejection on the grounds that one of skill would realize that the conditions refer to reaction conditions for producing a mutated amplified product, and further, that one of skill would glean these conditions from the specification.

Claim 9 is indefinite in its recitation of the phrase "under conditions" on the grounds that it is unclear whether these conditions refer to a fusion of a reverse transcriptase , or whether the conditions refer to amplification parameters such as time, or temperature, or to something else. Applicant has amended these claims to indicate that the conditions refer to the amplification reaction conditions.

Claims 11, 13, 15, 16, 19 and 20 are indefinite in their recitation of the phrase "reduced activity" because it is unclear how this reduction is accomplished. Applicant respectfully traverses the rejection on the grounds that the method for accomplishing the reduction does not render the meaning of the term "reduced activity" indefinite. The reduced activity is accomplished as a result of the physical structure of the fusion.

In light of these remarks and amendments, Applicant respectfully requests withdrawal and reconsideration of these 112 second paragraph rejections.

112 first paragraph

Claims 1-11, 13, 15, 19, and 25-30 are rejected under 35 USC 112, first paragraph, under written description on the grounds that the DNA polymerase fusion encompass any DNA polymerase with any amino acid sequence which modulates any activity of the DNA polymerase.

Applicant traverses the rejection on the grounds that Example 3 of the instant specification discloses an embodiment of the claimed fusion. Applicant notes that the fusion is comprised of two elements: polymerase and a modulator of the polymerase, the metes and bounds of the genus of both elements are well known to one of skill in the art.. The office action states "furthermore, no common elements or attributes of the variants as set forth in independent aims 1, 3, 5, 7, and 9 are disclosed. Applicant contends that the common attribute is the function of a polymerase-- a well known genus to one of skill. Note that unlike Fiers, this is not a case of isolating a compound with desired functionality, since numerous examples of the claimed genus have been disclosed in the specification. However, in accordance with the elected invention, the instant claims have been amended to recite that the claimed DNA polymerase fusion comprises wild type Pfu polymerase joined to Sso7d protein and functions as a DNA polymerase.

In light of these remarks and amendments, Applicant respectfully requests withdrawal and reconsideration of this 112 first paragraph rejection.

102(b)

Claims 1-4, 7-11, 13, 15, 19, and 25-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Wang (WO 01/082501).

Applicant respectfully traverses. To be anticipatory, a prior art reference must teach all the limitations of the claimed invention. Applicant submits that Wang does not meet all the limitations of the instant claims as newly amended. Specifically, Wang teaches a DNA polymerase fusion which is Pfu(wild type)-Sso7d, and teaches its DNA synthesis capacity in a buffer of pH 8.8. However, the claims as newly amended require the fusion be active at a pH of at least 9.3, a limitation not taught by Wang. Therefore Applicant contends that the cited Wang reference is not anticipatory and respectfully requests reconsideration and withdrawal of the instant rejection.

Claims 1-10, 13, 25, and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Gelfand et al. U.S. Patent 4,889,818.

Applicant respectfully traverses the rejection on the grounds that Gelfand et al. does not meet all the limitations of the instant claims as newly amended. Specifically, Gelfand et al. teaches a fusion DNA polymerase in a reagent buffer at pH of around 8 to 8.4. However, the claims as newly amended require the fusion be active at a pH of at least 9.3, a limitation not taught by Gelfand. Therefore, Applicant contends that the cited Gelfand reference is not anticipatory and respectfully requests reconsideration and withdrawal of the instant rejection.

Claims 1-11, 26, 28 and 29 are rejected under 35 U.S.C. 102(b) as being anticipated by Dahlberg et al. U.S. Patent 5,541,311.

Applicant respectfully traverses the rejection on the grounds that Dahlberg et al. does not meet all the limitations of the instant claims as newly amended. Specifically, Dahlberg et al. teaches a fusion DNA polymerase with reduced polymerization but does not teach activity of a fusion DNA polymerase at a pH greater than 9.3 as required by the claims as newly amended. Therefore Applicant contends that the cited Dahlberg et al. reference is not anticipatory and respectfully requests reconsideration and withdrawal of the instant rejection.

103(a)

Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang (2001) as applied to claims 1-4, 7-11, 13, 15, 19, and 25-30 above, and further in view of Sanger et al.

Applicant traverses the rejection on the grounds that the combined teachings of the cited references do not arrive at the claimed invention.

Specifically, as discussed above, Wang teaches a fusion DNA polymerase with polymerization in a buffer at pH 8, but does not teach activity of a fusion DNA polymerase at a pH greater than 9.3 as required by the claims as newly amended.

Nor does Sanger et al. teach activity of a fusion DNA polymerase at a pH greater than 9.3 as required by the claims as newly amended.. Sanger teaches that a polymerase fusion may be substituted for the polymerase itself in any method using a polymerase.

Therefore Applicant contends that the references taken together and/or individually, do not arrive at the claimed invention which requires activity of the fusion DNA polymerase at a pH greater than 93. Therefore, Applicant contends that the claimed invention is not obvious over Wang in view of Sanger et al. and respectfully requests reconsideration and withdrawal of the instant rejection.



***Conclusion***

Applicant submits that all claims are allowable as written and respectfully requests early favorable action by the Examiner. If the Examiner believes that a telephone conversation with Applicant's attorney's/agent would expedite prosecution of this application, the Examiner is cordially invited to call the undersigned attorney/agent of record.

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